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INDUSTRIAL SURVEYS

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An Outline for Communities and Manufacturers

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THE INDUSTRIAL CLUB OF ST. LOUIS
1930

INDUSTRIAL SURVEYS

* * *

An Outline for Communities and Manufacturers

BY

GEORGE C. SMITH

Director, Industrial Bureau, Industrial Club of Saint Louis

* * *

Chairman, Industrial Property Division, National Association of Real Estate Boards

* * *

Chairman, National Conference of Industrial Bureau Managers

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Nov. 1, 1930 DATED

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Preface

The Industrial Club of St. Louis has a twofold purpose in issuing this booklet—as a service to those desiring to foster the industrial development of their community, either through expanding existing enterprises or attracting new ones from the outside, and as a guide for those industries seeking locations for branch plants or contemplating the relocation of their main facilities.

American communities have wasted vast sums in their efforts at industrial expansion, launching extravagant advertising and sales campaigns without ever having ascertained what they have to offer any industry, and without having set up facilities for handling inquiries or for preparing reports for those who might be induced to respond to the advertising or sales appeal.

Manufacturers, for the most part, have been guided in the selection of their locations more by prejudice than by scientific research. It has been said by more than one authority that fully ninety per cent of our industries are located without any preliminary study of the economic fitness of the location. Birthright, and civic pride resulting therefrom, and the source of capital, have played a larger part in determining the present position of our manufacturing plants than has judgment based on research.

As our country more completely utilizes its national resources and reduces its pace of development because of lessened opportunities for exploration and exploitation, the success of established enterprises will depend more and more on economies resulting from location.

If this booklet saves a single city from a wasted community effort or serves to stimulate thought processes for a single manufacturer which will ultimately guide him to a most successful location, its publication will have been fully justified.

For the author, it should be said that, because of limitation of space imposed upon him, he has been obliged to condense into a few pages a text based on fifteen years' experience in plant location research and community development, which followed an almost equal period of economic training and teaching in some of the leading universities of this country. If the text seems dogmatic in places, brevity, rather than inability to develop the point, has been the cause.

L. WADE CHILDRESS, *President*,
Industrial Club of St. Louis.

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PART I

DISCUSSION

INTRODUCTION

It is generally recognized that the expansion of manufacturing activities is the quickest and most effective force stimulating permanent community growth. The attraction of tourists and convention delegates, the establishment of wholesale and retail activities, the location of transportation offices and shops and of insurance and other financial headquarters, the establishment of educational and governmental institutions, the location of hospitals—in fact, the attraction of any economic, political or social activity to a community—tends to increase that community's size. But none of these acts so quickly or so permanently as does the acquisition of new manufacturing operations.

No wonder, then, that the average chamber of commerce secretary finds his board of directors and membership clamoring for more factories, and altogether too often his ability as a secretary is measured too closely by his ability to attract new industries to his community.

Normally, an average American community enjoys a growth in population of about one per cent a year or from 10 to 15 per cent a decade, provided, of course, that the city is able, through some activity, to offer employment to its young men and women as they become of working age. But we see a great city like Detroit actually doubling, or more than doubling, its population every decade since it was founded, and Akron and Los Angeles adding as much as 30 per cent in a single year. We see a great state like North Carolina suddenly become one of the most prosperous and progressive in the nation. And, on the other hand—because of the lack of a permanent population-sustaining basis—we see Florida but a skeleton of its former self, determined, however, to regain as much of its hopes and values as it can, but on a foundation more stable than winter golf and freedom from inheritance taxes. Occasionally, we see a city like Tulsa built on the discovery of a new mineral supply. But Tulsa and its oil have prospered so long that other forces have developed to give it assurances of permanency. Or we see a city like Hartford built around the insurance business, or Hot Springs around mineral waters. Some cities are built around recreational facilities—Atlantic City, for example—and a few, none large, are built for the retired classes.

Whatever the principal force around which a city is built, that force is subject to stimulation through a sales effort. As intangible a thing as climate has been sold to build a state and a very great city. The home and educational facilities of many cities have been exploited by sales methods. And committees of leading citizens, too often perhaps, have sold their cities to the politicians for duplicate political activities. Convention and tourist bureaus are almost as numerous as chambers of commerce, and industrial bureaus are becoming so.

The attraction of industry to a community is not a simple matter of glib salesmanship. It often requires a great deal of patient and, at times, quite difficult research work—research into the operations and requirements of the industry and into the fitness of the community in respect to those requirements. Not often any more does a manufacturer locate his plant where his fancy or his family dictates. The introduction of cost accounting has taught him that some of his costs depend upon conditions beyond his control and may vary from one community to another. As he is in business to earn a profit, he is anxious to produce his goods at the lowest possible cost consistent with quality. As some costs may vary with location, the manufacturer wants to know where he can locate his factory to secure the lowest net cost of manufacturing and distribution.

The principal manufacturing costs which may be affected by location relate to:

Raw and semi-finished materials—including freight to the factory.

Labor, both skilled and common, and including wage scales, turnover and efficiency.

Power—including electricity, gas, oil and coal.

Water.

Cost of marketing—including freight to the markets.

Waste disposal.

Warehousing of both raw and finished products.

There are certain indirect or overhead costs which must also be considered, as they may vary from place to place. Chief among these are:

Cost of land and buildings.

Taxes.

Insurance.

Equipment.

Administrative expense, including salaries of officers and clerks, printing, stationery, advertising, etc.

Protection against climate, including heating, humidifiers, etc.

And besides these, there are those factors, not exactly measurable as costs, which affect the family life of the industrialist and therefore may affect the cost sheet. These have to do with the quality of the municipal and civic institutions; home life; the type of housing; the extent of home ownership and the facilities offered workingmen for acquiring their homes; the cost of living, markets and their operation, and the availability of fresh supplies of food stuffs; recreational facilities for both employer and employed; schools, churches, clubs and theaters, for mental stimulation and development; social agencies for the care of the unfortunate; and similar phases of community life.

Frequently the most unexpected of these latter factors may swing the mental balance for or against a community. The Almighty Dollar isn't always the thing uppermost in the mind of the executive, particularly if that executive expects to move to a new location.

A report on industrial development in the United States and Canada, issued by the Civic Development Committee of the National Electric Light Association and the Policy-holders' Service Bureau of the Metropolitan Life Insurance Company, summarizes as follows in the order of their reported importance, the reasons for all gains of plants for the United States as a whole, including relocations, branches, and new local industries:

1. Markets.
2. Labor.
3. Transportation.
4. Materials.
5. Available factory building.
6. Personal reasons.
7. Power and fuel.
8. Cheap rent.
9. Nearness to related industries.
10. Living conditions.
11. Financial aid.
12. Taxes.
13. Mergers and consolidations.
14. Cheap land.
15. Nearness to parent company.
16. Banking facilities.

This tabulation is presented, not as an endorsement of the report as a whole, but simply because it suggests the wide variety of factors governing the selection of a manufacturing location, as reported by manufacturers in several hundred cases. Merely a reading of the "reasons" indicates something of the scope of information needed to prepare reports of specific use in industrial development work.

The manufacturer, through his own efforts, or by using the services of an established engineering office, could gather together all the data necessary to enable him to arrive at a satisfactory determination of where his plant should be located. But he can more readily gather the data through properly constituted local agencies, where such exist. These local agencies are, of course, the chamber of commerce, commercial club, or similarly designated body. Because of the benefits accruing to a community through the acquisition of new industries, the manufacturer should feel no hesitancy in asking for information, however voluminous, to assist him in measuring the resources of a city as they relate to his particular enterprise.

Not all chambers of commerce are prepared, however, to render assistance to the manufacturer seeking a location, and many manufacturers, skeptical of the value of the service of a community agency, do not make use of it, even when available.

Communities, however, appear to have a duty to perform in this particular. Manufacturers, for the most part, have an opportunity to choose only one or two locations for an industry during their business lifetime.

They cannot, therefore, be considered entirely qualified to lay aside all prejudices for specific localities and outline and conduct comprehensive locational surveys for their specific enterprises. Industry should be assisted in finding the most economical point of manufacture and distribution in order to assure industrial stability and avoid the disadvantages incident to illogical location. Industries unsuccessful because of illogical location retard rather than stimulate community growth.

PURPOSES OF THE INDUSTRIAL SURVEY

Cities desiring to grow and to aid manufacturers in their search for preferred locations, must take inventory of what they have to offer industry. Such inventory is commonly called an "Industrial Survey." Surveys may be specific, made to reflect conditions of interest to a specific industry, or they may be general and include data indicative of the types of industry that might be developed or attracted to the locality surveyed.

Bearing in mind that the primary object of a survey is to bring together data which will enable a manufacturer to determine, in advance of actual operations, approximately what his manufacturing and distributing costs will be and whether or not living conditions are economical and enjoyable, the principal purposes of an Industrial Survey may be said to be:

1. To ascertain the *natural resources*, including mineral, agricultural, timber, and non-metallic products.

2. To ascertain the *industrial resources*, including available labor supply, both skilled and common; fuel; electric power; water; proximity to raw and semi-finished materials and to markets; transportation facilities, both rail and water.

3. To ascertain the *condition of industrial operations*, including the cost of labor, fuel, water, power, materials and transportation; taxes; labor unions; labor turnover; seasonal demand for labor; fire protection; restrictive state and local legislation.

4. To ascertain the *conditions of trade*, including wholesale and retail establishments, their markets and sources of supplies; public markets; commission merchants, etc.

5. To ascertain the *social conditions*, including the cost of living as to foods, rents, clothing, fuel, etc.; housing conditions; racial characteristics of the labor supply; schools and colleges; parks, playgrounds and other recreation facilities; theaters; churches; hospitals; hotels; outdoors sports; sidewalks and streets and their condition; street cleaning methods; sewers; city water; general and local factors affecting the health of the community; and general and local factors, such as elevation, humidity, barometric pressure, etc., affecting the individual efficiency of the workman.

6. To ascertain the *financial conditions*, including banks and trust companies; building and loan associations; investors, depositors, etc.

7. To locate definitely *suitable tracts of land for factory sites;* for trade centers; for housing developments; for community centers.

8. To facilitate the *preparation of briefs* setting forth these conditions and submitting arguments and plans for the future development of the community, both socially and industrially; to show what industries are needed and can be properly fostered to round out the community's economic development and remove the industrial slack existing.

Such a survey can be of great value to a community desiring to grow industrially, eitner by pointing out opportunities for growth or by indicating hindrances to growth. Also, it will be of value to the manufacturer in helping him determine his operating and distributing costs and possible profits.

THE TECHNIQUE OF AN INDUSTRIAL SURVEY

The Industrial Survey is an inventory. It is, therefore, only the beginning, and not the end, of the research. It is a tool with which reports prepared for prospective manufacturers or briefs designed to remedy or improve adverse conditions can be written quickly and without the necessity for completely original field work.

Being general in its nature and largely statistical, the industrial survey has no great permanent value. Rather, it should be considered a collection of open files, the data in which are correct and complete to the date of writing; likely in many instances to be out-of-date shortly after their compilation, but capable of being brought up to date again with but little effort through reference to indicated sources for information. In a growing country, with vast unexplored natural resources, with unusual energy, and with financial resources always seeking new investments, statistics get out of date quickly, sometimes even before the ink is dry. Hence, it is desirable—necessary, in fact—to consider the survey a static thing, to be altered as changing circumstances require, rather than to consider it final and completed, to be published in permanent binding—and finally to be thrown away because it no longer correctly describes the community, its conditions, or its opportunities.

Form of the Survey

Experience of several successful industrial bureaus teaches that the loose-leaf, multigraphed form of survey is much more practical than one printed and bound. This is true for several reasons.

In the first place, the report can be kept up to date without the necessity for complete republication.

Secondly, it can be better adapted to serve a specific purpose by excluding all extraneous matter not pertinent to a particular report.

Thirdly, it can be extended by original field work so as to meet the detailed requirements of a particular purpose—requirements which could not have been anticipated when the original survey was made. Such extensions can be typed on stationery and with style of type and color of ribbons to match the original survey and thus made a harmonious part of a completed report.

Fourthly, this method makes possible a flexible arrangement of material.

Finally, there can be no doubt but that a report, apparently prepared solely for a particular purpose, has more personal appeal and a greater sales value than a printed volume containing the same information.

Recently a general industrial survey of a mid-western city was nearing completion. Portions dealing with many subjects had been completed and multigraphed. One portion dealt with a statement of transportation facilities, another with coal resources and costs—two fairly static subjects in these days. Scarcely had these pages been multigraphed when a great trunk line railroad announced its intention of building a line into the city being surveyed; another trunk line, already there, acquired by stock purchase a third company also serving the community; construction on a connecting link between two belt-line railroads, theretofore widely separated, was announced; and the Interstate Commerce Commission ordered into effect a new scale of coal freight rates materially reducing the cost of coal to users in the community. Had the report been in printed and bound form, changes reflecting these new conditions could not have been made without considerable expense. Yet, without these changes the report would have been inaccurate and lacking some substantial sales data. Statistical sections of a survey tend to get out of date much more rapidly than descriptive portions of the character mentioned.

All descriptive matter should be nontechnical where possible, thus insuring more widespread reader interest. Sources from which data are drawn should be revealed, not only for the sake of giving credit where credit is due, but because the crediting of sources tends to establish a confidence in the reliability of the data and in the interpretations drawn therefrom.

Exhibits—Graphs, designed to summarize and interpret descriptive data, should be prepared where possible. They should be simple in outline and so prepared as to tell their story at a glance. Complicated and congested graphs do not add to the ease of reading reports and are, therefore, to be avoided. Neatness and artistic merit are most desirable. The employment of some organization or person skilled in drafting and lettering is essential if these characteristics are to be maintained. Too often the results of good field work are spoiled by amateurish graphs.

There are several good text-books on the making and use of graphs which are worthy of careful study by anyone interested in the preparation of industrial surveys and reports.

Maps—Maps showing the location of specific raw materials, market areas, competitive freight territories, transportation facilities, and like subject matter, should be prepared wherever possible.

Descriptions of specific properties suggested as of possible interest to a prospective industry should be accompanied by a street map upon which the properties are spotted and principal points of interest in the community are shown.

Specific property maps or plats should show the ground area, arrangement of buildings, if any, improved streets serving the property, railroad sidings, electric power lines, gas, water, sewers and local transportation facilities, and such other data as might be of interest to a possible purchaser or tenant.

A map of the immediate area surrounding the central city, and over which the economic and social life of the city predominates, should also be made a part of any industrial survey. Such an area is usually called the "metropolitan district." It is not to be confused with the so-called "metropolitan area" used by the U. S. Bureau of the Census in the 1920 and earlier census reports. The Conference of Industrial Bureau Managers, held under the auspices of the Chamber of Commerce of the United States, in cooperation with the Director of the Census, has prepared and agreed upon a new definition of "metropolitan area," and as all the data needed for determining the area are of character essential to a complete industrial survey, the definition is quoted here as follows:

"It is an area within which the conditions of manufacturing, trade, transportation, labor and living—in brief, the daily economic and social life—are predominantly influenced by the central city. Factors that should be taken into account are that it is an

"Area in which long-distance freight rates are the same.

"Area within switching limits.

"Area enjoying the same power service.

"Area in which retail stores make free delivery in their own vehicles.

"Area covered by local and suburban telephone service.

"Area within commuting distance.

"Population density is a factor to take into account, but as applied to a minor part of the metropolitan region, is a matter of less consequence than the others. A striking illustration is the considerable marsh area on the west side of the Hudson River which is clearly within the New York Metropolitan Region, but which has practically no inhabitants.

"All of these factors need not apply, but certainly several of them should, for the purpose is to include such territory, and only such territory—to emphasize what has been said before—as forms a part of the daily economic and social life of the metropolitan center by being the place of residence of city workers or the location of industries that center in the city."

Paper and Binding

Reports should be prepared on a good grade of bond paper, perferably 8½ x 11 inches, punched on the left-hand margin to fit a standard three-ring binder. Either paper or leather covers may be used, depending upon the use to which the particular copy is to be put and the importance of the project. Brass staples and washers, the staples conforming neatly to the minimum length

required, may be used to bind the report, and the cover should be so formed as to bind these staples inside the covers. String or ribbon binders do not prove satisfactory for filing purposes, nor do odd or over-sized covers.

Multigraphed portions of the report should conform to the size and style of type and color of ribbon used on the typewriters of the office. This is not suggested with any thought that the recipient of the report will be deceived into believing that the whole report has been especially typed for him, but solely in the interest of neatness and of pleasing appearance.

Arrangement of Material

No fixed arrangement for the sequence of subjects can be suggested, nor could any one arrangement be best in all circumstances. The loose-leaf form of report offers an advantage in this particular. Reports, being informative rather than argumentative, should be arranged so as to bring out first those points which will make the strongest appeal or impression upon the person for whom the report is written. Failing a knowledge of his mental characteristics, subjects may be arranged in the order of their importance—their importance to industry in general or their importance as they relate to the various cost factors of the specific industry. An electro-chemical company, for example, is more interested in power costs than in wage scales, and a steel mill may be more interested in freight costs on raw materials than in the competitive selling price of the materials. A general knowledge of the relative importance of the various community factors affecting costs will indicate, usually, the order in which subjects may be arranged. The arrangement will vary with reports for different industries and, at times, with reports for different individuals in the same industry.

It is well that any report requiring more than fifteen or twenty minutes to read should contain a carefully prepared summary, written in short, terse paragraphs. This summary should precede, and not follow, the main body of the report. Often it may be made to serve as a table of contents also. Whether or not there is a summary, every industrial survey report should contain a table of contents and the pages should be numbered for ready reference. They are prepared for, and submitted to, executives, whose time should be conserved.

Transmission

In view of the expense incident to their preparation and of the importance of their purpose, reports should be sent by registered, first class or air mail, when it is not practical to deliver them in person. The recipient cannot be expected to attach any more importance to a report than has the sender; hence, the desirability of sending it under proper auspices.

METHODS OF GETTING DATA

Unless facilities have been created for the constant revision of the survey data, for the specific interpretation of the data into locational reports, and for the more tedious and time-consuming follow-up work required to bring results out of the survey—there is grave doubt as to the wisdom of making any expenditure of either time or money in the preparation of a survey. The method to be employed in making the survey is, therefore, closely involved with the use to which the survey is to be put after it is made.

Undoubtedly, the most satisfactory method of getting industrial survey data, provided sufficient funds and time are available, is through the creation of a permanent industrial bureau, staffed by men trained in economic research and possessing technical knowledge in civil, mechanical, chemical, metallurgical and industrial engineering, geology, agriculture, and the like.

Funds for the creation and maintenance of such talented permanent staffs are not often available, however, and other methods must be found. The employment of engineering organizations of national reputation

or of the facilities of some of our leading educational institutions—of which at least one is ably organized for the work—offers an excellent substitute for the permanent technical staff, so far as the original preparation of the industrial survey is concerned. Reputable engineering firms will not ordinarily undertake the preparation of industrial surveys unless they have some assurance that a satisfactory follow-up system will be developed by the community desiring the survey. Experience has clearly indicated that surveys, unless kept up to date and vigorously applied, result in both wasted funds and useless community effort, and injure the prestige of the organization making them.

Some of the most satisfactory community surveys yet prepared have resulted from the work of local committees, carefully chosen for their special tasks and sufficiently enthused to insure proper effort. Almost without exception, however, such surveys have been made under the direction of a full-time, salaried executive who has assumed the responsibility of getting the various committees to function. A detailed examination of the outline which follows will indicate to an experienced chamber of commerce executive the number and character of committees needed for the fact-finding survey. The interpretation and presentation of the reports of the rather numerous committees then becomes a special problem to be handled by an executive committee or permanent staff, or may result in the employment of competent engineering counsel for analysis and suggestions.

For the purpose of gathering information from existing industries, because of the variety of data required, the use of general questionnaires has not been found satisfactory. In an industry of large, or perhaps even of average, size there is probably no one person who could answer specifically all the questions involved in a complete survey questionnaire. It is much better, therefore, to arrange questions in keeping with the departmental functions of business. For example, it is not likely that a single officer could furnish detailed information about raw material purchases and requirements and labor conditions and wage scales, or markets, waste products and industrial water. It is undoubtedly the best practice to acquaint the local head of the industry with the purposes of the survey and, through him, reach the several department heads with specific schedules of questions.

In this connection it should be added that attempts to make community industrial surveys entirely by mail seldom accomplish their purpose. Personal interviews, conducted by committee members or trained staff, are infinitely more valuable, if for no other reason than that during the interview matters of extreme importance, and, at times, of great delicacy, not possible to anticipate in the preparation of a questionnaire, will be brought up for discussion. Some of the most valuable results of a survey will be found to exist in the solution of problems thus presented.

Ordinarily it may be stated without fear of successful contradiction, that the staff of a chamber of commerce, unless specifically planned to provide for the making of a survey, is so overloaded with detail work incident to the numerous activities of the chamber, that no one on the staff has the necessary time to devote to completing a survey as comprehensive as is contemplated in this outline.

Chamber of commerce officers should realize, therefore, that the making of an industrial survey will necessitate some budget provision, regardless of the method to be employed in making it. Unless there is sufficient tangible interest in the community to provide the additional funds in the budget, there is little likelihood of sufficient interest to insure results from the survey, even if made. Under the circumstances, it would be better not to have made the survey at all.

SOURCES OF INDUSTRIAL SURVEY DATA

It is not possible to classify and list all books, reports, maps, charts, and the like, containing information generally or specifically useful in the making of an industrial survey. Particularly in the adaptation of a survey to form a brief for the location of a certain industry would a general reference list become impossible, for there would need to be inserted a classified list of virtually all literature relating to industry. It is possible, however, to list in small compass references to literature written on the subject of selecting a factory location and to indicate, besides, the most available sources of data useful in the preparation of survey reports.

Attention should be called to the fact that in almost every city of consequence there will be found to exist a number of public or semi-public boards or commissions whose files are replete with information useful in making an industrial inventory. City plan and zoning commissions, for example, will have collected a mass of data dealing with such subjects as available factory site areas, traffic congestion, local transportation facilities, parks, playgrounds, and the like. A careful study should be made of the work of various departments of state and local governments, as well as public and semi-public agencies, in order to ascertain the extent to which these departments and agencies can be drawn upon for reliable information. Official sources for data and opinions should always be established where possible.

Also, in those cities having good city directories, there will be available a certain amount of information concerning the social and fraternal agencies in existence and sources will be indicated from which can be gathered additional information relating thereto. The city directory, supplemented by the local telephone book, can also be used as a source from which to prepare a directory of manufacturers in the community, as well as directories of wholesalers and retailers.

For data relating to specific industries, use should be made of such indices as Wilson's Industrial Arts Index and the Engineering Index, issued by the American Society of Mechanical Engineers.

Encyclopedic articles and public library catalogs can generally be relied upon, also, to furnish references to standard, authoritative texts on various industries.

Because of the vast amount of information available in various departments of our Federal Government, it has been thought best to refer in some detail to the price lists of the Superintendent of Documents, Government Printing Office, Washington, D. C., rather than try to extract from these lists specific titles of available publications. The subjects listed are too numerous to permit republication here, but they have been grouped sufficiently well in the several price lists that reference to the lists will be found useful. Any or all of the lists can be had free of charge from the Superintendent of Documents.

The bibliography found at the end of the survey outline contains:

(1) a. Titles of several price lists of the Superintendent of Documents, Washington, D. C.

b. Catalog of publications of the Bureau of Foreign and Domestic Commerce, Washington, D. C.

(2) A few general references to data relating to industrial survey topics.

(3) A list of magazine articles, papers and addresses, and one or two books on the subject of selecting locations for industries.

(4) Selected list of industrial surveys of communities.

DISCOVERING PROSPECTS

After an industrial survey has been made, the grave question is, of course, how to get prospects. The question is quite beyond the purpose of this pamphlet, but some thoughts relative to it may nevertheless be in order.

After a survey has revealed data indicating the fitness of a community, because of power, labor, accessible raw materials, or what not, for a particular industry, it is a relatively simple matter, through the use of trade directories and financial manuals, to determine what companies in a specific field are in best financial condition, are committed to a branch plant policy of operating, and are so located in their various units as to be best served by the establishment of a plant in the area surveyed. Industrial surveys, however, will not often reveal exactly this specific type of industry, but may suggest only a general class from which one could be selected to fit into the environment of the community. For example, there may be a surplus of electric power available at attractive rates. A study of industries by classes will reveal those more largely dependent upon electricity and for which the power factor produces a relatively large proportion of the total cost of operation. Among such industries—keeping in mind their other requirements and the facilities offered by the community—selections can readily be made of those to be approached.

After having enumerated the various classes of industry established in the surveyed area, a mere subtraction of those established from a total classification of industries would, of course, reveal the classes of industries not local, and would facilitate a study for types of industries desirable to round out the economic development of the community. An analysis of raw materials consumed by existing industries will reveal those produced as finished products by other industries for which an ample local market is reasonably assured. In similar manner, a study of the products of local industries may suggest other industries which could use these products as their raw material, carrying them on through further processes of manufacture and refinement. The existence of a plant manufacturing one or more heavy chemicals, for example, suggests the possibility of a variety of plants for the production of intermediates and pharmaceuticals, or other chemical industries whose processes depend upon the use of these heavy chemicals.

If a detailed study of wholesale and retail outlets in the trade area served by the surveyed community has been made and the aggregate distribution of products calculated, there may be revealed a number of items marketed in sufficient quantities to justify the establishment of a plant for their production, provided, of course, the environmental influences are favorable to that production locally. The mere existence of a surplus distributed locally in excess of that produced locally does not, of itself, assure the wisdom of establishing a plant to care for that excess distribution, but does suggest considering the possibility, and may reveal a variety of lines meriting local support, in the event established industries cannot be induced to enter the local field, and to remove the economic slack existing.

The possibility for establishing supplementary and auxiliary industries to serve existing industries should always be a primary object of the industrial survey. Also, if there should be found to exist a substantial amount of seasonal employment, with definitely established periods of substantial unemployment, an effort should be made to search out those industries whose peaks of employment correspond to the off-peaks of the existing industries, in order that the community might be more prosperous the year round and insure better labor conditions for both employer and employed.

Newspaper accounts of strikes, fires and other industrial disturbances, secured directly or through the service of clipping agencies, might be found useful in suggesting the names of specific companies requiring

new plant facilities. Trade papers devoted to industries specifically adaptable to the conditions within the community should, of course, be read exhaustively, in order that the industrial committee or staff may be kept informed of developments within those industries. Reports of companies expanding their production facilities, and all trends within those industries, will be fruitful of prospect suggestions. Many trade papers report also the formation of new companies in their respective fields, and all new processes, practices and conditions out of which industrial prospects may come.

The existence locally of a successful industry suggests, of itself, the desirability of considering expansion possibilities in that or allied lines. It has often been said that a single company never made a national market of the community in which it is located. Competition of companies within a city or nearby does tend to create a recognition of the location as a market, and, having created a market, attracts to the community labor skilled in that industry, as well as buyers desiring its products. Manufacturers generally recognize this fact and will often assist in developing competitive or complementary industries in their own line, in order to gain the advantages accruing from a location in a recognized market.

Of course, no effort should be made to expand an operation where the existing market, supply of raw materials, or other limiting factors are absorbed by the established plant. In such instances, added enterprises only further divide the total volume of business and contribute no net gain to the community or its factories.

The difficulty of securing prospects is responsible primarily for the earlier suggestion that industrial surveys should not be made in a community not prepared to follow through the results of the survey. Committees, no matter how enthusiastic, cannot be expected to devote a large amount of time to the search for prospects, although they may, and sometimes do, render extremely valuable assistance in the acquisition of an industry after a prospect has been located. The analysis of the survey and determination of possible prospects require an immense amount of detail work, constant reading, and close attention to business matters from the particular viewpoint of getting prospects, and is the work of a special staff. Such a staff, having the detailed information revealed by the survey, will perhaps have much less difficulty in discovering prospects than might ordinarily be imagined. This conclusion rests upon the assumption, however, that the survey had as one of its primary objects the further development of the community industrially and to that extent it becomes a community sales manual requiring for its execution a staff personnel with sales as well as research ability.

PART II

THE OUTLINE

THE OUTLINE

No suggested outline can be made to fit equally well every city or industrial prospect. At best, such an outline can give only the common denominators likely to be subject to development statistically in all cities and applicable in a general way to all industries. Having the data available as outlined, the preparation of a special report then becomes a selective process, the general summary indicating the data wanted to aid the purpose proposed.

Part I of the survey outline is intended to suggest data concerning the government of the community only in so far as that subject relates to industrial development. For example, under the item "Education—Public Schools," it is not suggested that a complete survey of the public school system be indulged in, but that it be examined sufficiently to ascertain the extent to which the curriculum provides for educational courses of special value in industry, the adequacy of buildings, equipment and teaching staff for existing requirements, and the financial ability to provide for any expected increase in requirements. In the event the survey reveals any underdevelopment likely to cause interference with an industrial expansion program, then a complete education survey should be undertaken with, perhaps, a newly selected staff of specialists in that field.

INTRODUCTION

1—Area within the scope of the survey.①

Political boundary lines seldom delimit the economic or central city. As we are concerned with economic and not political data, care should be exercised in arriving at a definition of the area in order to bring within the scope of the survey all the territory existing as an economic unit. The following outline is suggested, therefore, not only for the central city but also for the other political subdivisions making up the metropolitan area of the central city:

a. Area and population of both central city and metropolitan area.
b. Population of towns and villages within the area.
c. Rural population within the area.

2—Historical sketch.

a. Briefly outlining the origin and development of the central city.
b. Population—present estimate and by decades. Growth of population in environs.
c. Other barometers of growth.②

3—Other environmental data should include:

a. County area.
  (1) Population.
    (a) Urban.
    (b) Rural.
  (2) Number of farms.
  (3) Land acres.
  (4) Acres cultivated.
  (5) Acres timber.
  (6) Acres water.
b. Inland or off-track villages.
  (1) Name.
  (2) Location.
  (3) Population.
  (4) Retail outlets.
  (5) Other economic data.

4—Location.

a. Defined in relation to position on national and state maps.
b. Other population centers—showing distances and travel time.③
c. Waterways.
d. Transportation facilities.
e. Freight rate classification.
f. Agricultural production.
g. Mineral production.
h. Timber production.
i. Industrial production.
j. Consuming areas.
k. Bodies of water.

5—Character of surrounding territory.

a. Geological description.
  (1) Surface.
  (2) Soil.
  (3) Timber.
  (4) Prairie.
  (5) Water.
  (6) Elevation.

① See Exhibit A for an outline map of the St. Louis metropolitan area, together with extracts from the official report to the Director of the Census, Washington, D. C., outlining method pursued in delimiting the area.

② For summary of growth barometers used by the St. Louis Industrial Bureau, see Exhibit B. This summary contains many suggestions for data generally available in American cities and is sufficiently comprehensive to indicate something of the character of the community's growth. These growth studies should be applied to the environs of the central city also wherever the necessary statistical data is readily available.

③ Exhibit C is an outline map entitled, "Sales Territory Overnight from St. Louis," prepared to show the central location of the city.

Exhibit D is an outline waterways map, designed to show the position of the city in relation to waterways transportation.

I. GOVERNMENT OF THE CENTRAL CITY

1—Describe briefly the form of government, the various offices, terms of office, and how filled.

2—Income and expenditures.

Show revenue by sources and expenditures by principal activities.

3—Departments and public services.

Describe briefly the organization, equipment and personnel of the following departments and public services rendered:

a. Fire—with losses and comparative insurance rates.
b. Police—with crime statistics.
c. Judiciary.
d. Health and sanitation—with birth and death statistics.
e. Streets and highways.④
f. Sewers.
g. Garbage—collection and disposal.
h. Water.
i. Education.
j. Public markets.

4—Indebtedness.

a. Bonded.
b. Other.
c. Debt margins permitted.

5—Taxation.

a. Schedule of tax rates.
b. Limitations on rates.
c. Methods of assessment and review.
d. Exemptions allowed.
e. Exemptions granted.
f. Assessment proportion to actual selling value
  (1) Industrial.
  (2) Residential.
  (3) Commercial.

6—Public improvement program, including description of civic center.

7—Zoning.

8—Building permits.

Classify and compare over a series of years.

a. Industrial: Number—Valuation.
b. Commercial.
c. Public.
d. Residential.
  (1) Frame.
  (2) Brick and stone.
  (3) Apartments.
  (4) Number of families accommodated.

9—Building code.

II. CIVIC AND SOCIAL DATA

1—Education.

a. Schools.
  (1) Public.
  (2) Private.
  (3) Parochial.
  (4) Colleges.

Including number of schools, number of teachers and number of pupils, descriptions of buildings and equipment, playgrounds and stadiums, and special courses relating to industry, such as vocational and night schools.

2—Churches:

Denominations — Number — Number of members.

3—Y. M. C. A.:

Buildings—Members—Activities.

4—Y. W. C. A.:

Buildings—Members—Activities.

5—Y. M. H. A.:

Buildings—Members—Activities.

6—Y. W. H. A.:

Buildings—Members—Activities.

7—Knights of Columbus:

Buildings—Members—Activities.

8—Library:

Number of volumes—Number of readers—How supported—Branches.

④ Besides a description of the departmental organization and its equipment, there should be a statement of—
Total miles of streets.
Miles unpaved.
Miles paved — widths.
Miles by types — concrete, asphalt, cobble, etc.
Paving program — last year — contemplated.
General condition.
How cleaned.
Alleys (same as for streets).
Sidewalks (same as for streets).
Traffic regulations and facilities.
Radial highways.

Lighting: Gas — Oil — Electricity — Miles of streets lighted — Special features, such as boulevard lights.

Maps — Major street plan, including widening projects — arterial highways — special trucking thoroughfares, etc.

In similar manner, other departmental services should be described and essential statistics gathered.

During the gathering of this information, data should be procured concerning wage scales paid various classes of labor in each city department.

9—Hospitals.
- a. Names.
- b. Number of beds.
- c. Number of free beds.
- d. Number of private rooms.
- e. Emergency facilities.
- f. Conducted under what auspices.

10—Public lodge halls.
- a. Name.
- b. Seating capacity.

11—Lodges—Fraternal organizations.
- a. Name.
- b. Chapters.
- c. Number of members.

12—Newspapers.
- a. Daily—Weekly—Foreign language—Religious.
- b. Circulation—Area covered by each.
- c. Politics.

13—Periodicals:
Name—Class—Circulation—Area covered.

14—Social agencies:
Name—Purpose—Effectiveness.

15—Labor unions.
- a. Name—Officers—Number of members.
- b. Local representative, American Federation of Labor.

16—Trade, industrial and commercial associations—objects and effectiveness.

17—Hotels.
- a. Name—Number of rooms—Number of baths—Rates.
- b. Convention facilities.

18—Public buildings.
- a. Local.
- b. County.
- c. State.
- d. Federal.

19—Postal facilities and receipts, including air mail.

20—Fairs—Conventions—Trade shows.
- a. Facilities.
- b. Records of.

21—Clubs: Social—Recreational.
- a. City.
- b. Country.

22—Arenas.

23—Parks and playgrounds.

24—Theaters and motion picture houses.

25—Fishing and hunting and other sport facilities.

26—Athletic facilities.

27—Radio broadcasting stations.

III. CLIMATE©

1—Characteristics.

2—Temperature.
- a. Average annual.
- b. Average seasonal.
- c. Seasonal range.
- d. Monthly average—maximum.
- e. Monthly average—minimum.
- f. Days 32° or lower, by months.
- g. Days 90° or higher, by months.
- h. Days 0° or lower, by months.
- i. Frost-free period.
- j. Date of early frost.
- k. Date of late frost.

3—Precipitation.
- a. Average annual—Monthly.
  - (1) Rainfall.
  - (2) Snowfall.
- b. Seasonal variation in amount and type.

4—Relative humidity.
- a. Average annual relative humidity.
- b. Seasonal variation in relation to temperatures.
- c. Daily maximums by months.

5—Sunshine.
- a. Per cent possible.
- b. Per cent annual.
- c. Per cent monthly.
- d. Per cent seasonal.

6—Wind.
- a. Prevailing direction—Velocity—Drift.
- b. Highest maximum by months.

© Exhibit E, "St. Louis Climate," is an excellent graph picturing almost at a glance a nearly complete story of the St. Louis climate. Note particularly the satisfactory showing of a lowering humidity as the summer temperatures occur. The chart has been so arranged as to show monthly conditions as well as trends and annual averages.

7—Weather.
- a. General description—Variations.

8—Fogs.

9—Hailstorms.

10—Tornadoes.

11—Thunderstorms.

IV. PUBLIC UTILITIES

Describe each of the public utilities, whether publicly or privately owned, including rates and fares. Generally these apply to—

1—Water.

2—Gas.

3—Electricity.

4—Street cars.

5—Buses.

6—Interurban lines.

7—Toll bridges.

V. NATURAL RESOURCES

1—Minerals.
- a. Kind—Principal producing centers, transportation facilities, and rates to central city
- b. Quantity available.
- c. Quality available.
- d. How used locally and abroad.
- e. Records of production.
- f. Where treated.

2—Water power.
- a. Developed.
- b. Undeveloped.
- c. Federal permits issued.

3—Fisheries.

4—Timber:
Available supply—Production.
- a. Commercial uses.
- b. Where used, in what quantities, and for what purposes.

5—Oil:
Area—Depth—Average flow—Duration of wells—Production.

6—Gas:
Area—Depth—Average flow—Duration of wells—Production—Pressure.

VI. AGRICULTURAL RESOURCES

1—Area.

2—Acres cultivated.

3—Crops:
Acres—Production.

4—Livestock:
Number—Production.

5—Poultry:
Number—Production—Eggs produced.

6—Orchards and small fruit:
Trees—Production.

7—Dairying.
- a. Milk production.
- b. Number dairy cattle.
- c. Creameries.
- d. Cheese factories.
- e. Cold storage.

8—Pasturage.

9—Forage crops.

10—Gardening (Vegetables—Flowers—Nurseries).

11—Co-operative associations.
- a. Market.
- b. Insurance.
- c. Breeding.

12—Rural public utilities.

13—Abandoned farms.

14—Tenement conditions.

15—Farm bureau or county agents.

VII. FINANCIAL INSTITUTIONS

1—Banks.
- a. National.
- b. State.
- c. Trust companies.
- d. Savings.
- e. Building and loan associations.
- f. Underwriters—Houses of origination.
- g. Investment houses.
- h. Stock exchange—Organization and listings.

2—Statistics.
- a. Capital.
- b. Surplus and undivided profits.
- c. Deposits.
- d. Number of depositors' accounts.
- e. Number of savings accounts.
- f. Total savings.
- g. Total assets.

3—Clearing house.
- a. Organization.
- b. Resources of members.
- c. Statistics of clearings and debits.

4—Interest rates prevailing.
- a. Charged.
- b. Credited to depositors.

VIII. WHOLESALE HOUSES

1—Capital.

2—Products bought—Tonnages and value.
- a. Locally.
- b. Outside.

3—Products sold.
- a. Locally.
- b. Outside.

IX. RETAIL ESTABLISHMENTS

1—Capital.

2—Products bought—Tonnages and value.
- a. Locally.
- b. Outside.

X. PRODUCE AND OTHER COMMISSION MERCHANTS

1—Capital.

2—Products bought—Tonnages and value.
- a. Locally.
- b. Outside.

3—Products sold—Tonnages and value.
- a. Locally.
- b. Outside.

4—Produce exchanges.
- a. Membership.
- b. Products handled.
- c. Volume handled.

XI. BUILDERS AND CONTRACTORS

1—Capital.

2—Types of construction.

3—Purchases of materials—Tonnages and values.
- a. Locally.
- b. Outside.

XII. OTHER LARGE SHIPPERS AND RECEIVERS OF FREIGHT

1—Capital.

2—Products bought or sold—Tonnages and values.
- a. Locally.
- b. Outside.

XIII. FACTORY LABOR

1—General labor condition—based on survey among factories.
- a. Diversification.
- b. Open or closed shop.
- c. Frequency of labor troubles.
- d. Contentedness.

2—Labor supply.
- a. U. S. Census statistics of local reservoir.
- b. Description of larger reservoir from which industrial labor is attracted to locality.
- c. Characteristics of labor.
  - (1) Rural.
  - (2) Urban.
  - (3) Agricultural—Mining—Lumber.
  - (4) Hill-billy.
  - (5) Per cent illiteracy.
  - (6) Per cent foreign born, by nationalities.
  - (7) Supply of common labor.
  - (8) Per cent negro labor.
  - (9) Skilled and semi-skilled.
  - (10) Male—Female.

3—Training facilities.
- a. Trade schools.
- b. Apprenticeship courses.
- c. Foremen's courses.

4—Labor nationality—Central city.
- a. Per cent native born.
- b. Per cent foreign born.
- c. Predominating nationalities.
- d. Per cent foreign born remaining aliens.
- e. Per cent foreign born non-English speaking.
- f. Per cent foreign born illiterate.
- g. Employment of various nationalities by types of industry. (Survey among local industries.)

5—Labor sex and type—Central city.
- a. Per cent males.
- b. Per cent females.
- c. Per cent males 16 years of age and over.
- d. Per cent females 16 years of age and over.
- e. Employment of males and females by types of industries. (Field survey.)

6—Available surpluses—Male or female.
- a. Why existing.

7—Labor efficiency.
Survey of comparative unit labor costs with branch plants similarly operated elsewhere. Statements of local manufacturers who have had experience or know of conditions elsewhere.

8—Labor turnover.
Survey among existing industries for per cent of labor turnover, expressed in per cent monthly or annual. Extent affected by seasonal employment.

9—Seasonal employment.
- a. Survey among existing industries and U. S. Census of monthly employment in manufactures.
- b. Causes for seasonal variation.
- c. Recommendations for supplementary employment.

10—Wage rates in effect.©
- a. Building trades.
- b. Metal trades.

11—Piece work—Bonus systems.
- a. Predominance of.
- b. Basing points.

12—Local labor unions.

13—Open and closed shop conditions.
- a. Percentage employed labor unionized by trades.

14—Strikes and lock-outs—Record and results.

XIV. HOUSING AND GENERAL LIVING CONDITIONS

1—General character of workmen's homes, including description of districts, condition of streets, alleys, and other public utilities.

2—Cost of housing, by types.
- a. Sales prices—Types and locations.
- b. Rental rates—Types and locations.

3—Agencies to provide housing facilities.

4—Agencies to provide financial assistance to purchasers.

5—Extent of home ownership.

6—Tenements.

XV. COST OF LIVING

1—Food (see U. S. Bureau of Labor, index figures for schedule of commodities).

2—Shelter.
- a. Rent.
- b. Cost of workmen's homes.

3—Clothing.

4—Public utility rates.
- a. Gas.
- b. Electricity.
- c. Telephone.
- d. Street car.
- e. Bus.
- f. Water.

5—General description of—
- a. Markets.
- b. Retail stores.
- c. Produce exchanges.
- d. Other agencies contributing to efficient and economical distribution of consumable products.

XVI. MANUFACTURING STATISTICS

1—General.
Based on reports of the U. S. Department of Commerce, Bureau of the Census.
- a. Classes of industry, showing for each class—
  - (1) Number of manufacturing establishments.
  - (2) Average number of wage earners.
  - (3) Wages paid.
  - (4) Cost of materials.
  - (5) Value of products.
  - (6) Value added by manufacture.
- b. The number of establishments for each class covered by the classification, "All other industries."
- c. The various classifications of the Census of Manufactures.
- d. Classifications not represented by one or more establishments, as an evidence of the industries not enjoyed locally.
- e. What lines abandoned and why—10 years.
- f. What industries moved away and why—5 years.
- g. What industries moved in and why—5 years.
- h. Servicing facilities.
  - (1) Repair and contract.
    - (a) Kind of work.
    - (b) Number of employees.

© Exhibit F contains a table of wages prevailing in industry in St. Louis and is submitted as a satisfactory classification for wage scales to be used in an industrial report.

2—Specific—for each company.

a. Raw material requirements.
   (1) Where procured.
   (2) Quantity—Quality.
   (3) Freight cost, inbound.
   (4) Other available sources.
b. Finished products available as material for other industries.
c. Other finished products—List quantity consumed by markets.
d. Waste products—Composition—How disposed of. Available for other industrial operations—Where—Value.
e. Competition—From what sources.
f. Market area for products—
   Sold to (1) wholesaler.
   Sold to (2) retailer.
   Sold to (3) consumer.
g. Labor.
   (1) By classes.
   (2) Wage scales.
h. Power.
   (1) How supplied.
   (2) Cost.
   (3) Quantity consumed monthly, K.W.H.

XVII. WATER FOR INDUSTRIAL USE

1—Raw river water.

a. Name of river—Distance from city.
b. Volume of flow.
c. Extent to which used by industry.
d. Special facilities required for its use.
e. Approximate cost.
f. Temperatures.

2—Mains water.

a. Description of municipal system.
b. Description of purification method.
c. Ownership of distribution facilities.
d. Capacity.
   (1) Of source.
   (2) Of treating facilities.
   (3) Of pumps.
   (4) Of reservoirs.
e. Consumption—Daily million gallons—Seasonal variations.
f. Chemical and bacteriological analysis of city water.
g. Hardness for boiler use.
h. Usual practice as to treating by industry.
i. Rates.
   (1) Industrial.
   (2) Domestic.
j. Temperatures.

3—Well water.

a. Extent to which used.
b. Source.
c. Uses.
d. Capacities and description of types of wells.
e. Depths—Cost of wells—Equipment.
f. Quality.
g. Treatment of water.
h. Cost of water treated.
i. Temperatures.

XVIII. GAS

1—Manufactured.

a. Description of manufacturing facilities.
b. Quantity and quality of gas produced.
c. Distribution facilities.
d. Rates for industrial and domestic use.

2—Natural.

a. Description of field from which drawn and of facilities to supply community from field.
b. Quantity and quality of gas available.
c. Distribution facilities.
d. Rates for industrial and domestic use.

XIX. ELECTRICITY

1—Source of electrical power.

a. Hydro.
b. Steam.

2—Description of producing facilities by companies to show —

a. Character of production.
b. Generating capacities.
c. Extent of interconnected system.
d. Dependability of service by field survey of outages.

3—Surplusages available.

4—Off-peak contracts available.

5—Kind of power.

a. Phase.
b. Cycle.
   (1) A. C.
   (2) D. C.
c. Voltage ordinarily delivered to industry.

6—Rates.

a. Power, industrial.
b. Light, domestic.

XX. COAL RESOURCES⑦

1—Description of coal-producing districts supplying local industries.

2—Per cent of total consumption from each district.

3—Freight rates from principal producing centers.

4—Sources for special requirements, such as

a. Coke.
b. Metallurgical coke.
c. Low-sulphur coal.

5—Coal characteristics, by districts.

a. High or low volatile.
b. Free burning.
c. Flame.
d. Ash.
e. Best type stokers.
f. Can it be used as powdered coal.

6—Market conditions.

a. Competing communities for same source.
b. Variety of sizes available.
c. Prices.

7—Approximate average coal analyses by districts.

a. Basis—
   (1) As received.
   (2) At mine.
   (3) Dried.
      (b) Moisture, per cent.
      (c) Volatile, per cent.
      (d) Fixed carbon, per cent.
      (e) Ash, per cent.

XXI. TRANSPORTATION FACILITIES

1—Railroads—Brief description of each.

a. Trunk line.
b. Short line.
c. Electric freight-carrying line.
d. Switching company.

2—Volume of freight traffic received and shipped.

3—Empty car supply.

4—Package car service for L. C. L. freight.⑧

a. List sailing days and destinations for each railroad.
b. Scheduled number of days to arrival.
c. Extent to which service is developed.

5—Freight and passenger trains.
Schedules and services if of special interest in respect to markets, etc. (see Exhibit C).

6—River transportation (see Exhibit D).

a. Description of river system.
b. Facilities.
c. Channels.
d. Services available and frequencies.
e. Comparative rates vs. railroads.
f. Joint river and rail rates.
g. Tonnages handled.

7—Ocean transportation.

a. Description of port facilities—Piers—Warehouses—Elevators—Channels, etc.
b. Services available.
c. Comparative rate structures.
d. Tonnage statistics.

8—Highways.

a. Description of highway system.
b. Transportation facilities and services available.
c. Comparative freight rates.
d. Tonnages handled.

9—Air services.

a. Facilities and services available, including description of airports.

10—Local and interurban transportation.

a. Street car service.
b. Bus service.
c. Steam railroad service.
d. Description of facilities and services.

11—Local service facilities.

a. Description and location of
   (1) Freight stations.
      (a) On track.
      (b) Off track.
   (2) Team tracks.
   (3) Special loading and unloading facilities, such as—
      (a) Auto platforms.
      (b) Cranes.
      (c) Derricks.

⑦ Exhibit G is a combination coal map and coal data chart containing a complete story of the coal resources of the St. Louis district.

⑧ Exhibit H, "Package Car Service from St. Louis," is an outline map of the United States showing the actual time required, not by schedule but by performance, to deliver LCL freight from St. Louis to various points throughout the United States.

(4) Piers and other waterfront facilities, such as—
(a) Grain elevators.
(b) Bulk cargo cranes, etc.
(5) Storage warehouses.
(a) Railroad owned.
(b) Privately owned.
(6) Union depots for freight and passenger bus service.

12—Switching facilities—Charges and schedules.

13—Competitive freight territories.

Maps should be prepared to show those territories which can be more economically served because of lower frieght rates from the city surveyed than from principal competing centers. Data for the preparation of these maps can be obtained from the railroads or from the traffic department of the local chamber of commerce. A single class carload freight rate (preferably fourth or fifth class) should be used rather than commodity rates. Full recognition should be given to existing water or rail and water combination rates for the city surveyed and for its competitors. (See Exhibit I, maps 1 and 2, for map plans designed to show at a glance the territories served by one city in competition with another. These maps show St. Louis vs. Chicago and vs. New York.)

XXII. MARKETS

1—Local and regional markets.
a. Area served by manufacturers.
b. Area served by wholesalers.
c. Area served by retailers.
d. Characteristics.
e. Buying power.
f. Consuming power.

2—Location of competing communities.
a. Freight rate comparisons.

3—Volume.
a. Commodities distributed by
(1) Retail stores.
(2) Wholesale houses.
(3) Manufacturers.
b. Commodities purchased by each of above.
c. Commodities purchased from local sources.
d. Commodities purchased from outside sources.
e. Commodities available for local production because of excess local consumption over production.

4—Wholesale outlets classified.

5—Retail outlets classified.

6—Merchandise distribution facilities. Description of actual movement of merchandise based on less carload freight movement.◎
a. Via railroads.
b. Via trucks.
c. Via private facilities.

7—Determination of areas constituting natural and actual trading area dominated by the central city.
a. For wholesale trade.
b. For retail trade.

8—Foreign trade.
a. Volume.
b. Terminal facilities—
(1) Piers.
(2) Warehouses.
(3) Floating equipment.
(4) Special facilities.
c. Customs facilities.
d. Foreign consular service.
e. Inspections.
f. Foreign freight brokers.

XXIII. TAXES

1—Tax levy on real estate.

2—Tax levy on personal property.

3—Assessments, per cent of value.

4—Exemptions.

5—Various rates for
a. Municipal taxes.
b. Township taxes.
c. Park Board taxes.
d. County taxes.
e. State taxes.
(Including school, poor, etc.)

6—Poll tax.

7—Business license fees.

8—Income tax.

9—Sales tax.

10—Tax limits.

11—Comparisons with competing locations.

◎ Exhibit J shows the actual distribution throughout the United States of less-carload merchandise in package cars from St. Louis shippers. It indicates at a glance that the city is a national distributing center and a study of the figures for cars shipped will indicate something of the extent of the trade by various sections of the country. The map was prepared to show the distribution area, national and regional, enjoyed by industries marketing from St. Louis.

XXIV. CORPORATION FEES

1—Amount of incorporation fee.

2—Valuation of no-par-value stock.

3—Annual franchise fee—how assessed and rate of assessment.

4—Corporate income tax.

5—Taxes on foreign corporations.
a. How assessed.
b. Rates of assessment.

XXV. RESTRICTIVE LEGISLATION —STATE AND LOCAL

1—Labor laws.
a. Hours.
b. Ages.
c. Female.
d. Children.

2—Tenement.

3—Workmen's compensation and liability insurance.

4—Inspections—Safety.

5—Zoning.

6—Building codes.

XXVI. INDUSTRIAL PROPERTIES AVAILABLE

1—General description of industrial sections of community.

2—Detailed description of industrial properties available.◎
a. Improved.
b. Unimproved.

3—Chamber of commerce relations with local real estate exchange or board.

XXVII. SPECIAL INDUSTRIAL INDUCEMENTS

1—Exemption from taxation.

2—Free sites.

3—Free buildings.

4—Rent-free buildings.

5—Stock subscriptions.

6—Cash bonuses.

7—Moving expenses.

8—Other financial assistance.

9—Extension of public utilities.
a. Sidings.
b. Streets.
c. Water.
d. Sewers, etc.

10—Policy of city administration towards new industries.

XXVIII. STATEMENTS FROM LEADING LOCAL MANUFACTURERS CONCERNING DESIRABILITY OF LOCAL LOCATIONS

These endorsements have the same value for a community selling campaign as have those of satisfied customers for an industrial or other sale.

XXIX. OPPORTUNITIES FOR THE INVESTMENT OF CAPITAL

Field interviews during the making of the survey will reveal opportunities for the expansion of existing industries through furnishing either additional equipment or working capital. All these should be noted for later study and report. The successful expansion of an established plant, from the standpoint of the community, is as desirable as the bringing in of a new one equal in size to the expansion and is generally attended with less risk of disturbance to local conditions.

XXX. INDUSTRIAL PROSPECTS

A tabulated list of the recommendations of heads of local industries, utility companies and others, plus a list of those revealed by analysis of the survey report data.

◎ Exhibit K is a form used in the office of the St. Louis Industrial Bureau for filing detailed data relative to available properties, whether improved or unimproved. Exhibits L and M show cards used for indexing improved and unimproved properties, respectively. These can be arranged by size, section of city, broker listing, or in other ways.

PART III

BIBLIOGRAPHY
AND
EXHIBITS

INDEX TO ABBREVIATIONS USED IN BIBLIOGRAPHY

Am. Bankers Assn. J. ..... *American Bankers Association Journal*
Am. Ind. ..... *American Industries*
Am. Inst. Chem. Eng. Trans. ... *American Institute of Chemical Engineers, Transactions*
Ann. Am. Acad. ..... *Annals of the American Academy of Political and Social Science*
Cassier's Ind. Management ..... *Cassier's Industrial Management*
Chem. & Met. Eng. ..... *Chemical & Metallurgical Engineering*
Elec. W. ..... *Electrical World*
Eng. N. ..... *Engineering News-Record*
Factory & Ind. Management ..... *Factory and Industrial Management*
Ind. Management ..... *Industrial Management*
Ind. & Eng. Chem. ..... *Industrial and Engineering Chemistry*
Ind. Prop. Div., *Industrial Property Division, National Association of Real Estate Boards, Chicago, Illinois.*
Mag. of Business ..... *Magazine of Business*
Manuf. Ind. ..... *Manufacturing Industries*
Mech. Eng. ..... *Mechanical Engineering*
N. A. R. E. B. ..... *National Association of Real Estate Boards, Chicago, Illinois*
N. E. L. A. Bul. ..... *National Electric Light Association Bulletin*
Oil, Paint & Drug Rep. ..... *Oil, Paint and Drug Reporter*
Paper Tr. J. ..... *Paper Trade Journal*
Pub. Serv. Management ..... *Public Service Management*

PRICE LISTS OF GOVERNMENT PUBLICATIONS

(A) Superintendent of Documents, Washington, D. C.

These lists, published for free distribution, are excellent bibliographies to studies made by and for various governmental agencies. Copies of the lists should be procured and their contents studied for citation to items of special importance.

Agriculture.
- Agricultural chemistry (Price List No. 40).
- Animal industry (Price List No. 38). Farm animals, poultry and dairying.
- Farm management (Price List No. 68). Includes farm accounts, credits, marketing, homes and statistics.
- Farmers' bulletins (Price List No. 16). Department circulars, agricultural yearbooks, leaflets and statistical and technical bulletins.
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- Soils and fertilizers (Price List No. 46).

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Finance (Price List No. 28). Banking, budget accounting.

Fishes (Price List No. 21). Includes shellfish, lobsters, sponges.

Foods and cooking (Price List No. 11). Canning, cold storage, home economics.

Forestry (Price List No. 43). Tree planting, wood tests, and lumber industries.

Geography and explorations (Price List No. 35). Includes guidebooks natural wonders, scenery and national parks.

Geological survey (Price List No. 15). Geology, mineral resources, water supply.

Government periodicals (Price List No. 36).

Health (Price List No. 51). Vital statistics, diseases, drugs, sanitation, sewers and water.

Housing.
- Suburbanites and home builders (Price List No. 72). Includes playgrounds, community centers and highways.

Immigration (Price List No. 67). Includes Americanization, naturalization, citizenship, negroes and aliens.

Insular possessions, Cuba and the Panama Canal (Price List No. 32).

Irrigation, drainage and water power (Price List No. 42).

Labor (Price List No. 33). Child labor, employers' liability, wages, insurance, women and strikes.

Maps (Price List No. 53). World, national, state, geodetic, weather and topographic.

Mines (Price List No. 58). Includes also explosives, fuel, gas, gasoline, petroleum, smoke abatement, alloys, etc.

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Tariff and taxation (Price List No. 37).

Transportation.
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- Transportation (Price List No. 25). Includes railroad and shipping problems, postal service, telegraphs and telephones.

Weather, astronomy and meteorology (Price List No. 48).

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SELECTED LIST OF INDUSTRIAL SURVEYS OF COMMUNITIES

The following are a few of the more important community industrial surveys available for distribution. The list has been selected to include various types of surveys, some made by engineering organizations, some by committees, and others by permanent bureau staffs. A few are of the loose-leaf variety, the contents of which are designed to be used as fillers for specific reports, rather than as comprehensive industrial surveys.

Alabama

Birmingham: Why Birmingham? Chamber of Commerce, Birmingham, Ala. Lists industries and gives production figures on coal, steel, clay, etc. 28 pages.

Arkansas

Pine Bluff: Industrial survey of Pine Bluff. Chamber of Commerce, Pine Bluff, Ark. A report illustrated with maps, charts, graphs, etc., giving statistical data on industrial and agricultural conditions in Pine Bluff and vicinity. 138 pages.

Texarkana: Industrial survey of Texarkana. Chamber of Commerce, Texarkana, Ark. Indexed report presenting all available data on Texarkana's industry.

California

Los Angeles: General industrial report of Los Angeles County. Industrial Department, Los Angeles Chamber of Commerce.

Oakland: Industrial survey of Oakland. Chamber of Commerce, Oakland, Cal. A multigraphed, loose-leaf report with several excellent maps and charts. Pages unnumbered.

San Francisco: Report on the general economic and industrial conditions of the San Francisco Peninsula. Industrial Department, San Francisco Chamber of Commerce. Loose-leaf, numerous charts and maps.

Colorado

Denver: An economic survey of Denver and Colorado. Compiled by the Industrial Development Department of the Denver Chamber of Commerce. A loose-leaf report descriptive of city and state industrial resources. 24 pages.

Florida

Miami: Miami industrial survey. Industrial Board, City of Miami, Miami, Florida. Report of industrial conditions in Miami and surrounding counties. 37 pages.

Pensacola: Industrial and economic survey. Chamber of Commerce, Pensacola, Fla. Part 1: General statistics and facts. Part 2: Port, industrial, agricultural and tourist trade development. Appendix: 103 pages of supporting data. Parts 1 and 2 contain 238 pages, with numerous charts.

Georgia

Atlanta: Key to Atlanta. Industrial Bureau, Atlanta Chamber of Commerce. An illustrated booklet containing some maps and graphs and a large collection of statistical data relating to Atlanta and the state of Georgia.

Savannah: Industrial facilities of Savannah. Industrial Committee of Savannah, Ga., 711 Liberty Bank and Trust Building. A typewritten survey of approximately 40 pages containing a fairly comprehensive outline of general industrial information.

Illinois

Chicago: Chicago facts. Industrial Department, Chicago Association of Commerce, Chicago, Ill. Presents in brief form important statistics on industrial developments. Illustrated with maps and charts. 35 pages.

Indiana

Muncie: General commercial, civic and industrial survey of Muncie, Delaware County, Ind. Chamber of Commerce, Muncie, Ind. A list of manufacturers and wholesalers is included.

Iowa

Davenport: Survey prepared for the Davenport Industrial Commission, Chamber of Commerce Building, Davenport, Iowa, by a local committee. 58 pages.

Louisiana

New Orleans: Survey of the New Orleans industrial zone. Prepared by the J. F. Coleman Engineering Company for the National Advertising Committee of the New Orleans Association of Commerce. Extensively illustrated with maps, graphs and photographs. 44 pages.

Maine

Portland: Port of Portland, State of Maine, and its Hinterland. Published by the Directors of the Port of Portland, State of Maine, and sold for $2.00 in fabricoid binding and $1.00 in paper cover. A listing of all port and terminal facilities. Contains a description of the port of Portland and of the resources of the state of Maine. 90 pages.

Maryland

Baltimore: General industrial advantages of Baltimore. Industrial Bureau, Baltimore Association of Commerce, H. F. French, Director. A loose-leaf report of general information concerning industrial conditions in the city, multigraphed for special report filler.

Baltimore: Industrial survey of Baltimore. Out of print. Projected by J. E. Aldred and carried out under the supervision of E. V. Illmer, Secretary, and Advisory Committee. This is said to be the first comprehensive industrial survey of any city in the United States and was published in January, 1915.

Massachusetts

Worcester: Industrial survey of Worcester. Industrial Bureau, Worcester Chamber of Commerce. A printed, paper-bound report of 31 pages describing certain industries in detail.

Minnesota

Duluth: Complete report of Pace industrial survey of the city of Duluth. Industrial Bureau, Duluth Chamber of Commerce. A report of industrial conditions in Duluth. Statistics on raw materials, labor, marketing costs, markets, etc. 100 pages.

Minneapolis: Facts on Minneapolis. Minneapolis Committee, Industrial Bureau, Minneapolis, Minn. A graphic report which includes description of raw materials, data on power, markets, etc. 55 pages.

St. Paul: Industrial and civic survey of St. Paul by Charles J. Moos, Postmaster. A printed report of 97 pages and 38 graphs.

Mississippi

Jackson: The book of Jackson, Miss. A profusely illustrated booklet containing general and industrial information about Jackson. 64 pages.

Missouri

North Kansas City: North Kansas City. Profusely illustrated booklet showing development of properties owned by the North Kansas City Development Company, Railway Exchange Building, Kansas City, Mo. 40 pages.

St. Louis: Industrial report on St. Louis. Industrial Bureau, Industrial Club of St. Louis, Mo. A summary giving facts and figures on distribution, manufacturing, transportation, etc., in St. Louis and surrounding territory; loose-leaf, multigraphed, for special report filler. 54 pages.

St. Louis: St. Louis as it is today. Industrial Bureau, Industrial Club of St. Louis, St. Louis, Mo. Mostly pictorial and giving in story form the civic and social sides of life in St. Louis. 64 pages.

New York

Syracuse: Industrial survey of Syracuse. Syracuse Chamber of Commerce. Presents in general form Syracuse's industrial situation. 50 pages.

North Carolina

North Carolina resources and industries. Commerce and Industry Division, State of North Carolina, Department of Conservation and Development, Raleigh, N. C. Contains facts and figures on industry of every county in the state. Well illustrated with charts and maps. 287 pages.

Asheville: Asheville hand-book. Asheville Chamber of Commerce. Condensed summary of important facts and figures on the resources and development of Asheville and Buncombe Counties. 40 pages.

Raleigh: Market analysis of the Raleigh sales area. Raleigh Trade Commission, Capital Club Building, Raleigh, N. C. Illustrated booklet containing statistical data relating to Raleigh and its environs. 20 pages.

North and South Carolina

Piedmont Carolinas. Duke Power Company, Charlotte, N. C. Summary of manufacturing, agriculture, mining conditions, etc., in western area of North and South Carolina. Illustrated with maps, pictures, charts and graphs. 48 pages.

Ohio

Cincinnati: Come to Cincinnati. Published by the Cincinnati Enquirer and descriptive of the civic, cultural and industrial phases of the community. Contains several charts and maps. 110 pages.

Dayton: Facts about Dayton. Dayton Chamber of Commerce. Presents resources and advantages of Dayton as an industrial center. 59 pages.

Oklahoma

Report on the industrial resources of the state of Oklahoma for the Hon. W. B. Pine. Prepared by Lockwood, Greene & Company, Inc. Contains numerous statistical tables.

Pennsylvania

Harrisburg: Industrial survey of Harrisburg. Harrisburg Chamber of Commerce, 1928. A comprehensive loose-leaf, mimeographed report with several charts. 84 pages.

Wilkes-Barre: Industrial survey of the Wyoming Valley. Wilkes-Barre-Wyoming Valley Chamber of Commerce. A survey by Lockwood Greene Engineers, Inc. 1930. 269 pages.

Rhode Island

Providence: Industrial survey of metropolitan Providence. Conducted by the Division of Industrial and Municipal Research, Massachusetts Institute of Technology, for the Providence Chamber of Commerce. Illustrated with charts and tables presenting manufacturing and distribution figures of all products made in Providence. 92 pages.

South Carolina

(See also North and South Carolina)

Charleston: Hand-book of the port of Charleston. Bureau of Port Development, Charleston, S. C. Information on industrial, shipping and commercial developments in Charleston.

Charleston: Why big business chooses Charleston. Roy S. MacElwee, Ph.D., for Charleston Chamber of Commerce. A printed paper pamphlet of 31 pages.

Spartanburg: Industrial survey of Spartanburg. Industrial Commission, Montgomery Building. A printed loose-leaf report made up of a series of seven special bulletins on plant location factors. Well illustrated with maps and charts. 76 pages.

Tennessee

Memphis: Facts and figures of Memphis. Industrial Division, Memphis Chamber of Commerce. Gives a statistical resume of Memphis section. Well illustrated with graphs, charts, maps, etc. 26 pages.

Texas

Dallas: Distribution center. Industrial Department, Dallas Chamber of Commerce. Transportation facilities, competitive freight territories, national distribution, etc. Printed. 56 pages.

Dallas: Market analysis of the Southwest. Industrial Department, Dallas Chamber of Commerce. An analysis of economic progress, with market map of the Southwest. Printed. 32 pages.

Dallas: Industrial survey of manufacturing facilities and opportunities, as appraised by Lockwood, Greene & Co. Industrial Department, Dallas Chamber of Commerce. Printed report of labor, power, fuel, and industrial developments. 72 pages.

Washington

Seattle: An industrial analysis of Seattle, the Puget Sound district and the Pacific Northwest. Seattle Chamber of Commerce. Covers markets, manufacturing costs, raw materials, state laws, and essential statistics, with maps and graphs. 52 pages.

Wisconsin

Fond du Lac: Industrial survey of Fond du Lac. Fond du Lac Chamber of Commerce. Indexed report containing facts and figures of the city's industrial growth. 62 pages.

EXHIBIT A

ST. LOUIS METROPOLITAN AREA

The following extracts from a letter to W. M. Steuart, Director, Bureau of the Census, Washington, D. C., explains quite fully just how the St. Louis metropolitan area was defined. The explanation may be of service in helping other cities define their metropolitan regions.

"Mr. George C. Smith, Director of the Industrial Bureau, then presented the maps prepared by that organization. These maps outlined the areas of such determining factors as telephone service, daily commuter zones, gas service, newspaper carrier delivery, power and light service, city water service, retail store delivery (free), switching limits, mail delivery by carriers, daily routes of solicitors, and the old basis area map of 1920. A map showing all the areas was presented upon which a proposed metropolitan area was outlined following the composite area lines.

"All the maps were given careful consideration by the committee and a motion was passed designating the composite area as the official metropolitan area.

"The area designated as the metropolitan district of St. Louis comprises 848 square miles and has an estimated population of 1,315,000, inclusive of 848,100 in St. Louis. This entire district is homogeneous, dominated in its economic and social life by the central city and fostered throughout in its industrial development by the Industrial Club of St. Louis. Industries largely owned in St. Louis and controlled from central offices in the city are found throughout the district.

"Virtually the entire district is served by daily delivery from the principal department stores, by the metropolitan newspapers over direct carrier routes, by the telephone company through local exchanges, and by other closely affiliated public utility companies serving water, gas and electricity. With minor exceptions, uniform through freight rates apply from and to the entire district. Local transportation facilities, which include street car, bus, interurban lines and commuter service by steam trains, supply an abundance of transportation in all parts of the district, and a highly developed network of highways affords easy communication by automobile.

"The district includes 39 cities and towns, each with a population approximately in excess of 1,000.

"Brief comments concerning some of the factors used in determining the area to be included in the St. Louis metropolitan district may be in order.

"The entire district lies well within a radius of 25 miles of downtown St. Louis. Non-resident memberships cannot be held in the principal clubs of St. Louis by persons residing within this 25-mile radius. Our clubs, therefore, for years have defined a considerably larger area than has been included in the defined district as local.

"Through freight rates from and to St. Louis do not apply over uniform areas around St. Louis for trunk line, transcontinental, southeastern and southwestern shipments.

"The entire district is included within the daily trucking area of all companies interviewed. Some, in fact, deliver daily over an area substantially larger than the designated district.

"The area served by daily free delivery by trucks of the leading department stores does not include St. Charles on the west, Alton on the north, nor Edwardsville and Collinsville on the east. Delivery costs to these localities are absorbed, however. The same condition holds for delivery of daily metropolitan newspapers by direct carrier service, although these papers enjoy a large circulation in the four cities named, where delivery is provided by news agencies, which, instead of the newspapers, hire the carriers.

"Even the most remote sections of the entire district contain many commuters, who find daily and regular employment in the central city, traveling to and from their homes in private automobiles over a highly developed network of highways, in buses run on regular schedule, in street cars, interurban electric cars, or by steam railroad on commuter tickets. The latter afford commuter rates and services over the entire district.

"Electricity is supplied principally by the Union Electric Light and Power Company of Missouri. Only last week this company applied for permission to absorb several small distributing companies owned by the same holding company which controls its stock. If this permission is granted, the entire district will be served by a single producing company from its series of four generating stations which now supply an area much larger than that embraced in the district.

"The entire district is covered by daily routes of solicitors and collectors operating from St. Louis headquarters, and, except Alton, the entire district is served through the local exchanges of the Southwestern Bell Telephone Company. Alton is in the territory of the Illinois Bell Telephone Company, but the long-distance rates between St. Louis and Alton are no higher than local rates between St. Louis and Belleville and are lower than the local rates between St. Louis and St. Charles.

"The bulk of the population living in the three outlying townships in St. Louis County lives in those portions of the townships lying nearest to St. Louis and are sustained largely by St. Louis activities. All incorporated places and townships included within the area have a population substantially in excess of 150 to the square mile. In fact, had this been the only factor considered, the district would have been much larger than the area indicated.

"Our Advisory Board has approached this task conservatively, omitting all portions of the surrounding territory concerning which there may have been any doubt. Our claims for a metropolitan district are modest. The district, as defined by our Advisory Board, includes all of the district as defined by the Bureau of the Census in the 1920 Census and includes all of the area previously designated as adjacent territory, except areas in St. Charles County, Missouri, and Monroe County, Illinois. There have been added to this adjacent territory the city of St. Charles, Missouri, and the townships of Edwardsville, Collinsville, Caseyville and St. Clair, together with the incorporated towns in these townships."

EXHIBIT A—Continued

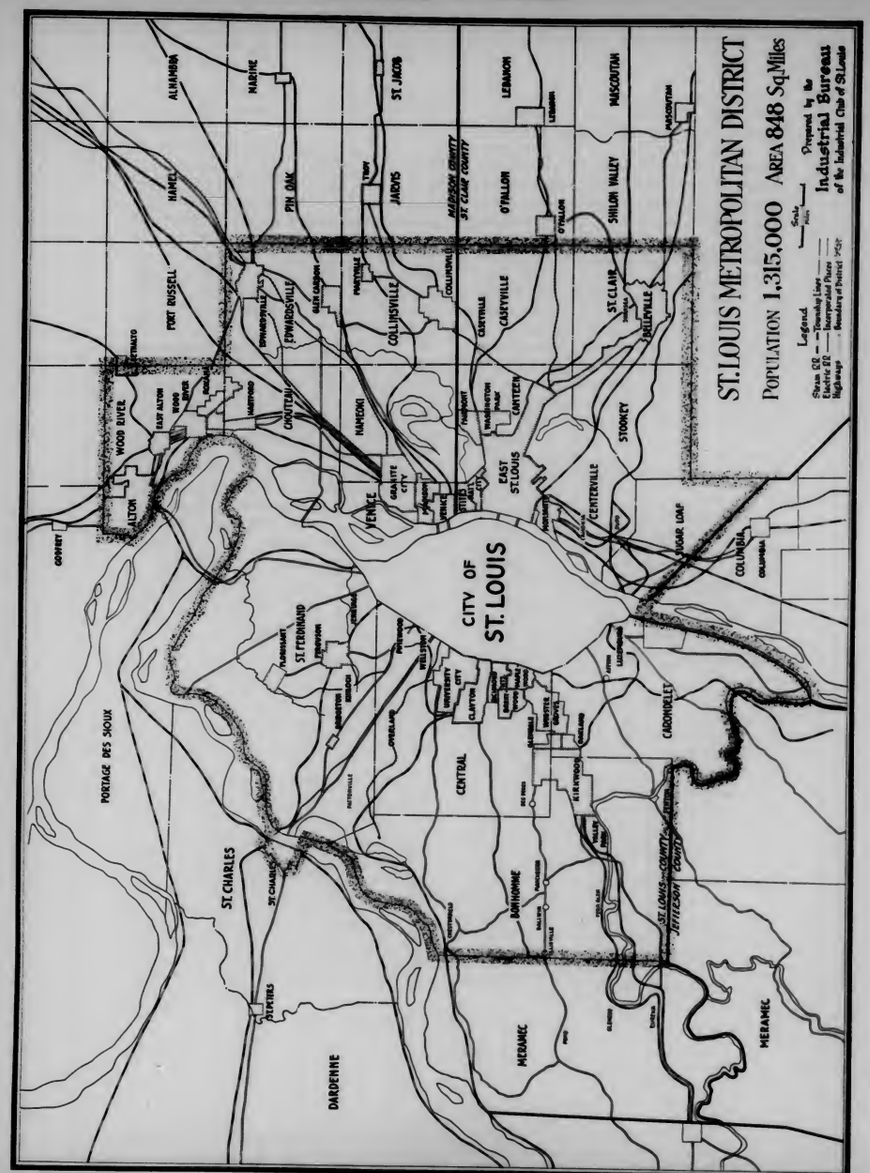


EXHIBIT B

BAROMETERS OF ST. LOUIS' GROWTH

The following barometers, with one or two exceptions, apply only to the area within the city limits of St. Louis, which limits have been fixed since 1876. Within this limitation, the figures give a fair picture of the city's expansion. Its growth, however, is actually greater, due to its natural development, unaffected by annexation, beyond the fixed limits into St. Louis County and across the Mississippi River into Illinois.

The stability of St. Louis and its industrial progress are indicated in its uniform annual increase in population, increases in building activity, assessed valuation of property, value of products and number of wage earners employed in industry. St. Louis has always been free from booms and other temporary inflations.

The progressiveness of St. Louis is evident in the increased interest in the cultural and educational opportunities available to every citizen, the measure of which is also contained in some of the following barometers:

BAROMETER	Period of Years	Percentage of Increase
Population of St. Louis	1880–1928	141.95
Population of Missouri	1880–1928	62.47
Building Permits	1915–1929	136.85
Assessed Valuation of Property	1915–1928	98.29
Postal Receipts	1915–1929	140.42
Value of Products Manufactured	1904–1927	252.41
Wage Earners in Manufacturing Industries	1904–1927	33.11
Wages Paid in Manufacturing Industries	1904–1927	219.58
Street Car and Bus Lines—Revenue Passengers	1915–1929	13.42
Telephones in Use	1915–1928	207.38
Loaded Freight Cars Interchanged	1915–1929	50.32
Consumption of Water	1915–1928	24.37
Gas Sales	1915–1928	54.24
Electric Sales	1919–1928	108.95
Bank Capital, Surplus and Undivided Profits	1915–1929	— 1.14
Total Resources	1915–1929	73.00
Deposits	1915–1929	96.98
Bank Clearings	1915–1929	75.23
Debits to Individual Accounts	1922–1929	41.47
Banks' and Bankers' Debits	1922–1929	11.25
Total Debits	1922–1929	29.07
Public Library—Total Volumes	1915–1929	81 27
Public Library—Volumes Lent for Home Use	1915–1929	100.62
Missouri Botanical Garden Attendance	1915–1929	76.09
Municipal Opera—Paid Admissions	1919–1929	251.16
Art Museum—Attendance	1915–1929	77.29
Public Schools—Average Daily Attendance	1915–1929	15.02
Public Schools—Total Receipts	1915–1929	172.26
Public Schools—Total Expenditures	1915–1929	155.30
Public Schools—Expenditure per Pupil	1915–1929	113.86

— Decrease.

EXHIBIT C

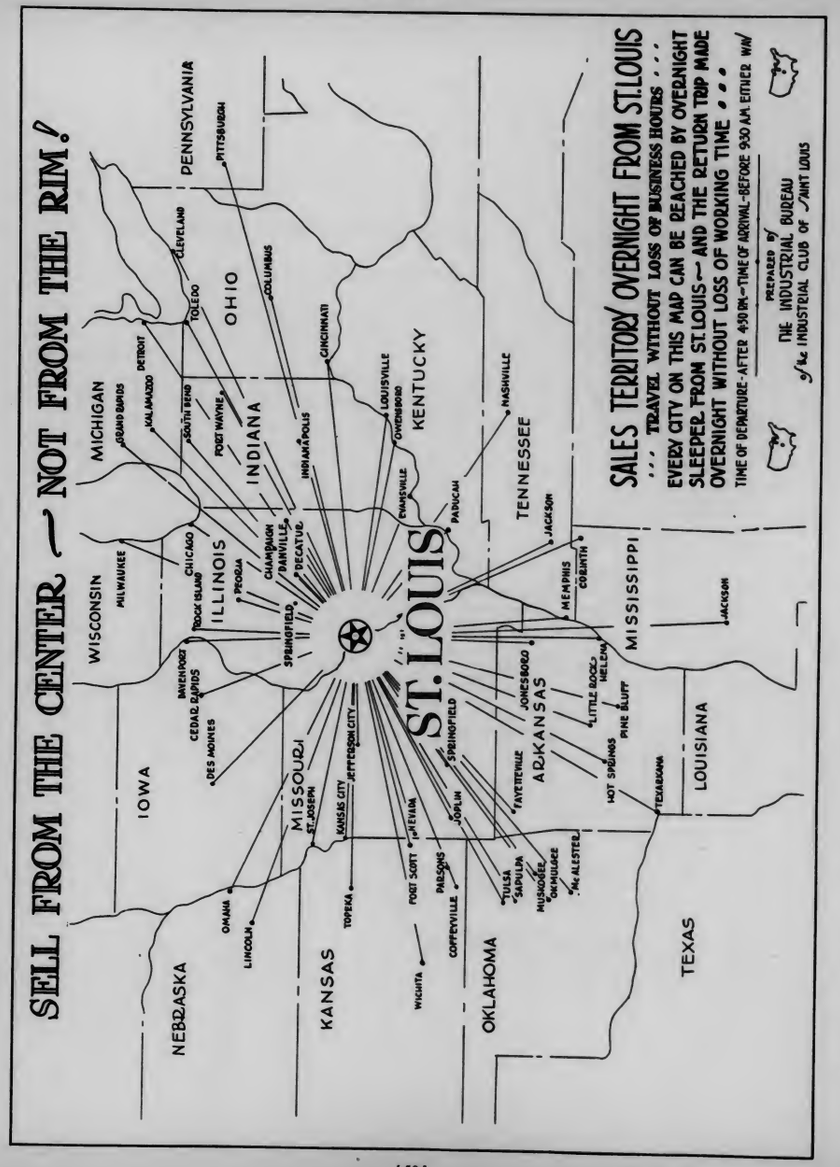


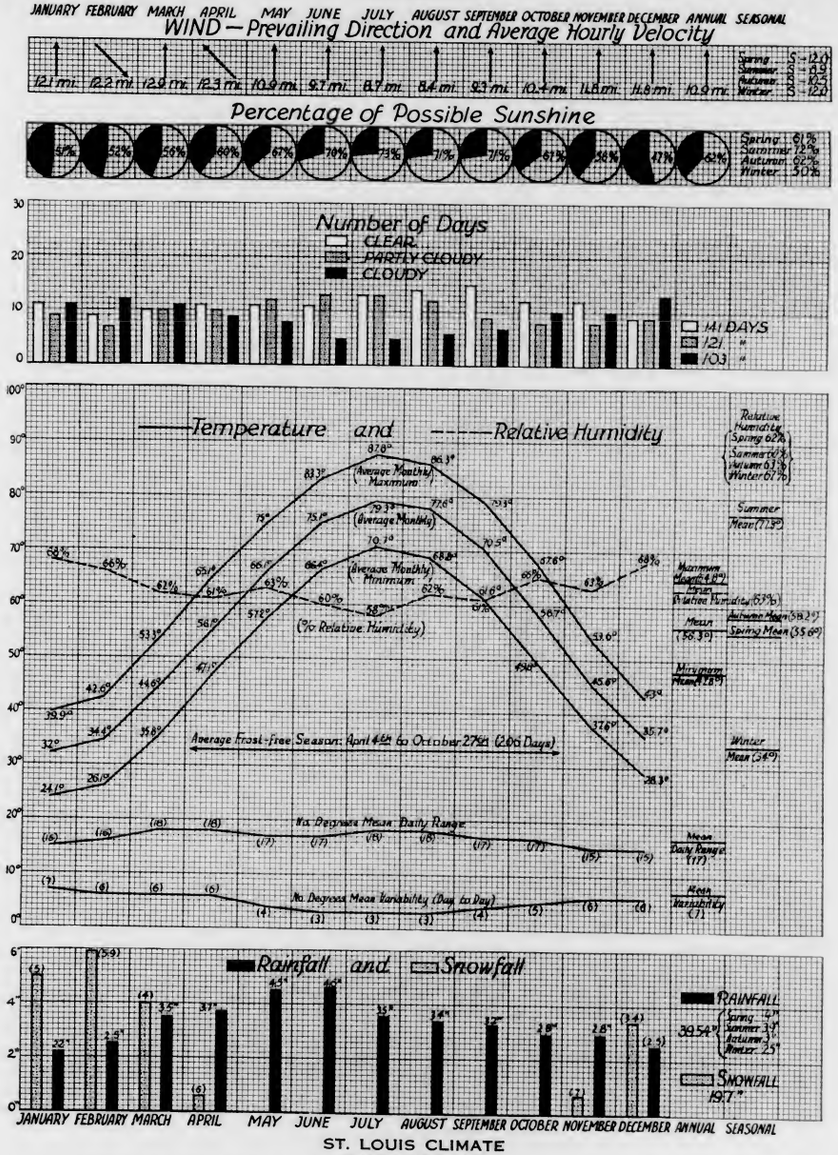
EXHIBIT D

THE MISSISSIPPI WATERWAYS SYSTEM

THE WORLD'S GREATEST INLAND WATERWAY

INDUSTRIAL BUREAU OF THE INDUSTRIAL CLUB OF ST. LOUIS

EXHIBIT E


JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER ANNUAL SEASONAL
WIND — Prevailing Direction and Average Hourly Velocity
12.1 mi. 12.2 mi. 12.9 mi. 12.3 mi. 10.9 mi. 9.7 mi. 8.7 mi. 8.4 mi. 9.3 mi. 10.4 mi. 11.8 mi. 11.8 mi. 10.9 mi.
Spring S - 12.0
Summer S - 9.9
Autumn S - 10.5
Winter S - 12.0
Percentage of Possible Sunshine
61% 52% 56% 60% 67% 70% 73% 71% 71% 61% 56% 47% 42%
Spring 61%
Summer 72%
Autumn 62%
Winter 50%
Number of Days
CLEAR
PARTLY CLOUDY
CLOUDY
141 DAYS
121 "
103 "
Temperature and Relative Humidity
Average Monthly Maximum
Average Monthly
Average Monthly Minimum
(% Relative Humidity)
Relative Humidity Spring 62%
Summer 71%
Autumn 63%
Winter 61%
Summer Mean (71.3°)
Maximum Mean (78.8°)
Autumn Mean (58.2°)
Mean (50.3°)
Spring Mean (55.6°)
Minimum Mean (37.9°)
Winter Mean (34.9°)
Average Frost-Free Season: April 14th to October 27th (206 Days)
No. Degrees Mean Daily Range
Mean Daily Range (17°)
No. Degrees Mean Variability (Day to Day)
Mean Variability (7°)
Rainfall and Snowfall
RAINFALL
39.54"
Spring 7"
Summer 13"
Autumn 9"
Winter 10"
SNOWFALL
19.7"
JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER ANNUAL SEASONAL

ST. LOUIS CLIMATE

AVERAGES SINCE 1871

PREPARED FROM OFFICIAL RECORDS OF U. S. WEATHER BUREAU BY INDUSTRIAL BUREAU OF INDUSTRIAL CLUB OF ST. LOUIS.

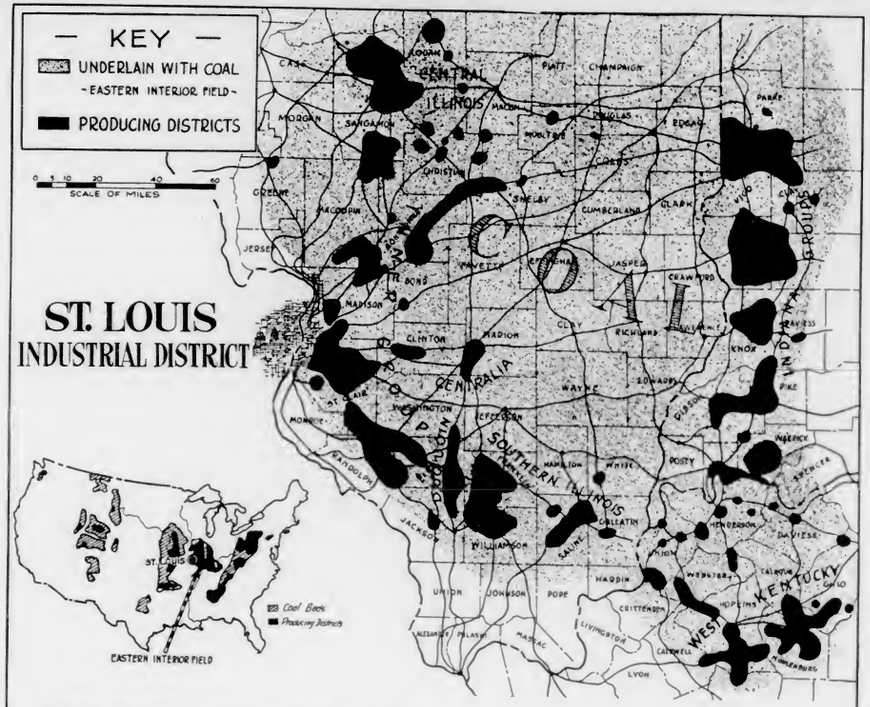
EXHIBIT F

WAGE RATES IN EFFECT AT ST. LOUIS, MO.

(CENTS PER HOUR)

Male Workers	Average	Minimum	Maximum	Most General
Assembler, Heavy Work	59.5	42	82	50–70
Assembler, Light Work	55.4	37	86	49–70
Blacksmith, General	68.1	54	103.8	55–75
Boilermaker	77	66	85	70–78
Boilermaker's Helper	50	45	60	45–60
Cabinet Maker	67.8	50	75	65–75
Carpenter, General	65.6	46	89	60–75
Crane Operator, Locomotive	64	55	74	60–72
Crane Operator, Electric	52.8	43	80	43–60
Die Maker	76.7	65.5	85	76–85
Drill Press Operator	52.8	35	88	45–55
Electrician (Plant)	66.8	46	94	60–75
Engineer, Power Plant Operating	81.3	50	110	70–98
Engineer, Fireman, Operating	50	50	50	50
Fireman, Boiler	47.6	33	65	40–55
Gear Cutter, Operator	67	66	68	66–68
Handy Man	53	35	75	40–50
Inspector, Factory Production	60.3	42	83	60–65
Laborer	39.5	32	50	35–40
Lathe Operator	65.5	55	93	60–70
Machinist, General	70.9	55	100	60–75
Machinist's Helper	47	33.3	62.5	40–50
Millwright, Maintenance	63.5	45	80	54–68
Molder, Iron and Brass	81.5	55.8	110	63–98
Pattern Maker, Metal	76	70	90	70–80
Pattern Maker, Wood	93.7	82	130	82–90
Pipe Fitter, General	63.5	53	80	55–68
Pipe Fitter's Helper	46	30	58	40–55
Planer Operator	60	55	68	60–65
Plater and Polisher	72.7	53	100	71–90
Punch and Stamping Press Operator	51.9	30	65	50–65
Screw Machine Operator (Hand)	56	50	65	50–60
Screw Machine Operator (Automatic)	60.8	45	80	55–65
Screw Machine Operator (Set Up)	63	56	75	56–75
Sheet Metal Worker	68.2	55	100	55–65
Sheet Metal Worker's Helper	51.6	43	75	45–55
Tinsmith	69.6	55	100	55–70
Toolmaker	72.7	67	90	68–85
Welder, Oxy-Acetylene	73.5	60	87.5	65–80
Welder, Electric Spot	63.9	41	85	50–75
Woodworker, Machine Operator	65	45	75	65–75
Woodworker, Bench Hand	62.8	40	89	60–75
Female Workers				
Beginners	24.9	20	35	20–25
Semi-Skilled	29.7	25	35	27–35
Skilled	39	31	55	35–50
Forewomen	49	46	55	46–52

EXHIBIT G



Coal is the chief source of power for the St. Louis Industrial District.

The St. Louis Industrial District is centrally located on the western edge of the Eastern Interior coal field. This bed of bituminous coal, testing about 12,500 B. T. U. per lb. (dry basis), and ranging in thickness from 5 to 11 feet, extends across the state of Illinois and into Indiana and Kentucky.

100,000,000 Tons annual coal productive capacity is available with present equipment within 110 miles of St. Louis.

10,000,000 Tons of coal, approximately, is consumed annually in the St. Louis Industrial District. It is drawn mainly from the following producing districts, listed in the order of tonnage supplied: Inner Group, Southern Illinois, DuQuoin, West Kentucky.

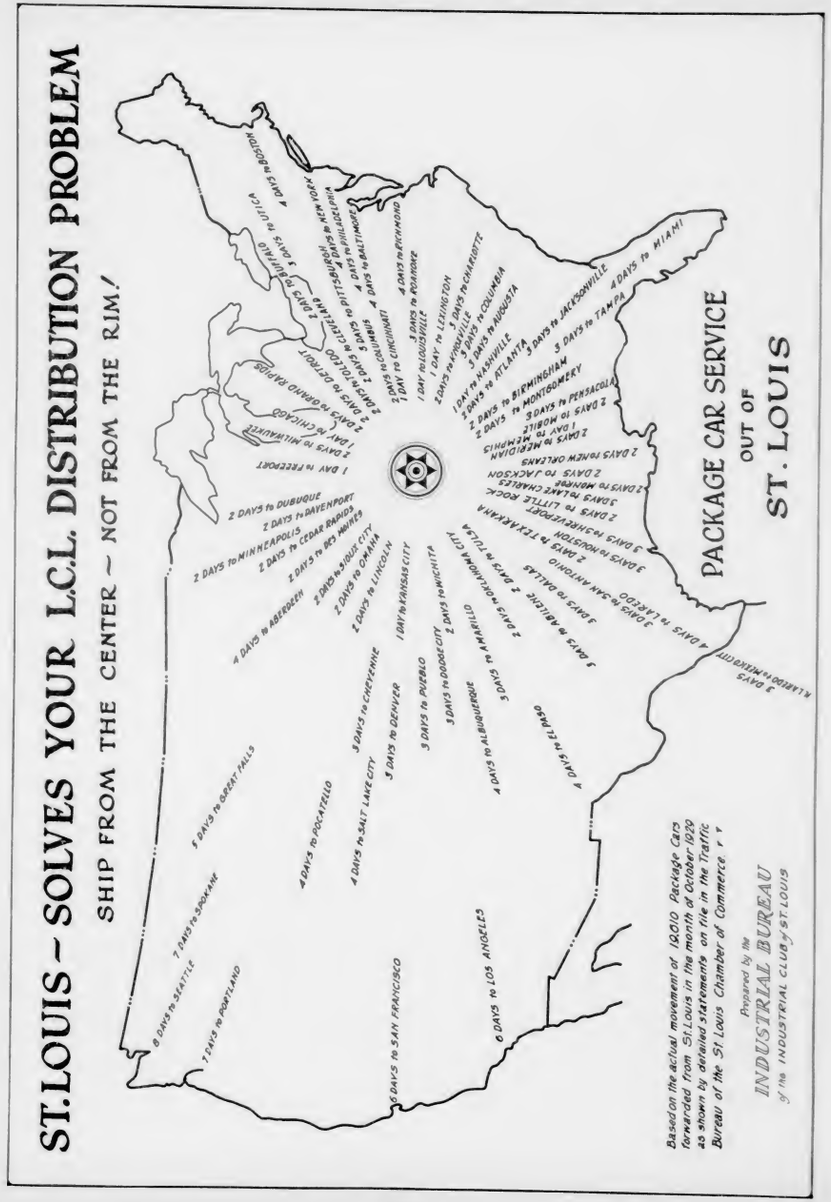
Coke produced from selected Illinois coal of less than 1% sulphur content is used here daily in the operation of blast furnaces.

The approximate average coal analyses (as received basis) of the major producing districts are:

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	B.T.U.
INNER GROUP	11.85	35.10	38.80	10.45	3.80	10850
DUQUOIN	9.95	33.75	44.21	9.96	2.13	11356
SOUTHERN ILLINOIS	8.60	32.22	48.56	8.80	1.82	12055
WEST KENTUCKY	7.50	38.10	42.26	8.90	3.24	11955

PREPARED BY INDUSTRIAL BUREAU OF INDUSTRIAL CLUB OF ST LOUIS

EXHIBIT H


ST. LOUIS — SOLVES YOUR L.C.L. DISTRIBUTION PROBLEM
SHIP FROM THE CENTER — NOT FROM THE RIM!
PACKAGE CAR SERVICE
OUT OF
ST. LOUIS
Based on the actual movement of 10010 Package Cars forwarded from St. Louis in the month of October 1929 as shown by detailed statements on file in the Traffic Bureau of the St. Louis Chamber of Commerce.
Prepared by the
INDUSTRIAL BUREAU
of the INDUSTRIAL CLUB of ST LOUIS

[56]

ST. LOUIS AND CHICAGO
FREIGHT TERRITORIES

Showing the territory into which shipments from St. Louis enjoy as low or lower rates than from Chicago.

Prepared by the
INDUSTRIAL BUREAU
of the Industrial Club of St. Louis
from data compiled by the
Traffic Bureau of the St. Louis Chamber of Commerce

EXHIBIT I (1)

[57]

ST. LOUIS AND NEW YORK
FREIGHT TERRITORIES

Showing the territory into which shipments from St. Louis enjoy lower rates than from New York, giving New York the advantage of water-rail rates where lower than all-rail.

Prepared by the
INDUSTRIAL BUREAU
of the Industrial Club of St. Louis
from data compiled by the
Traffic Bureau of the St. Louis Chamber of Commerce

EXHIBIT I (2)

EXHIBIT J

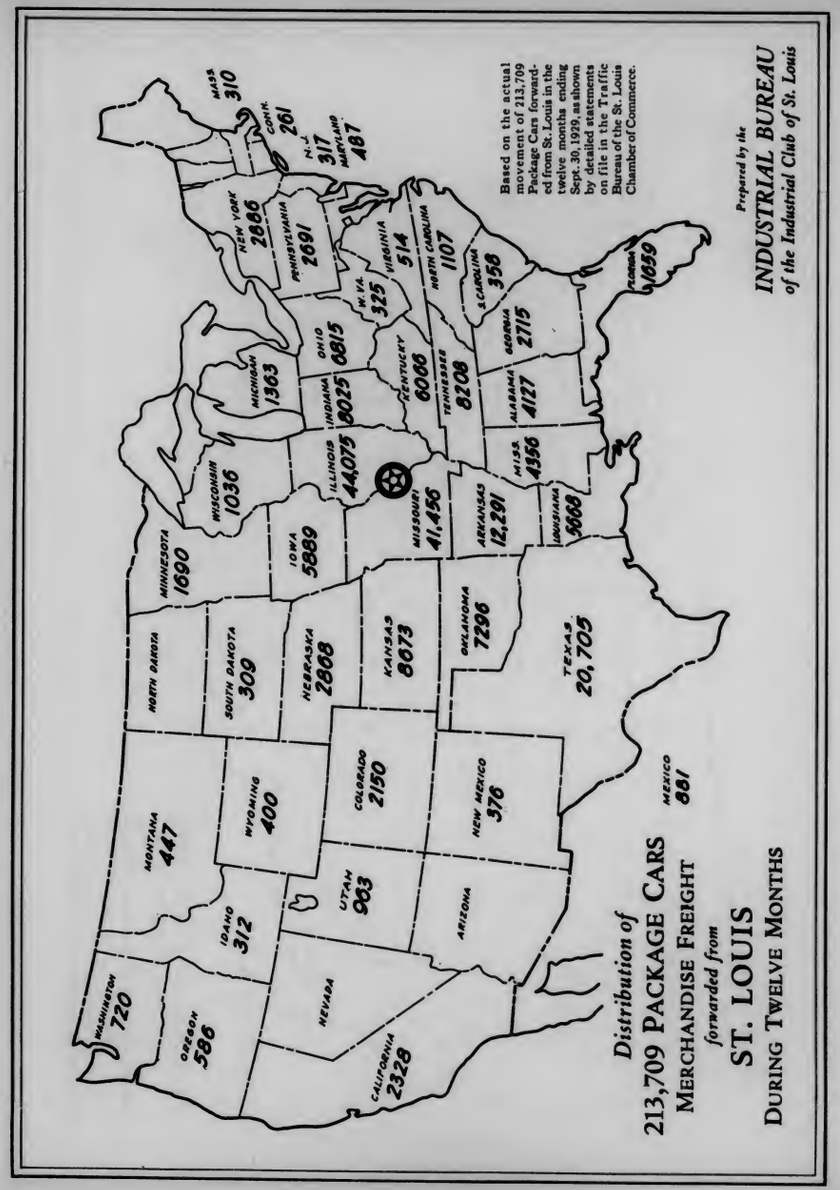


EXHIBIT K

FORM FOR FILING DATA RELATIVE TO AVAILABLE PROPERTIES

Description — Date

Location — Section

Agent or Owner — Serial No.

BUILDINGS

Construction	Floor Area	Dimensions	Stories High	Ceiling Height	Type	Floors		Bays
						Material	Load	

Purpose Used — When Built

Insurance Rate — Possession

Remarks

LAND

Frontage — Depth

Area

Yard Space

R. R. Siding

Water Front

Grade

Remarks

EQUIPMENT

Elevators

Heating

Sprinkler

Wiring

Engine Room Eqpt.

Mfg. Equipment

FACILITIES

Water

Sewerage

Gas

Electricity

Local Transportation

PRICE

Sale Price

Mortgage

Mortgage Rate — Expires

Lease Price — Per Sq. Ft.

Lease Years

Taxable Value

Taxes Paid by

EXHIBIT L

CARD FOR INDEXING IMPROVED PROPERTY

Area	Serial No.	Date
Section		
Location		
Dimensions		
Yard Space		
R. R. Siding		
Sale Price		
Lease Price		Per Sq. Ft.
Purpose Used		
Remarks		
Agent or Owner		

EXHIBIT M

CARD FOR INDEXING UNIMPROVED PROPERTY

Area	Serial No.	Date
Section		
Location		
Dimensions		
R. R. Siding		
Sale Price		
Lease Price		
Remarks		
Agent or Owner		

Date Due

Mar. 26			
AUG 1	1945		
8/8			
NOV 20	1950		

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